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THE VEGETATION OF KANYAKUMARI, KANYAKUMARI DISTRICT

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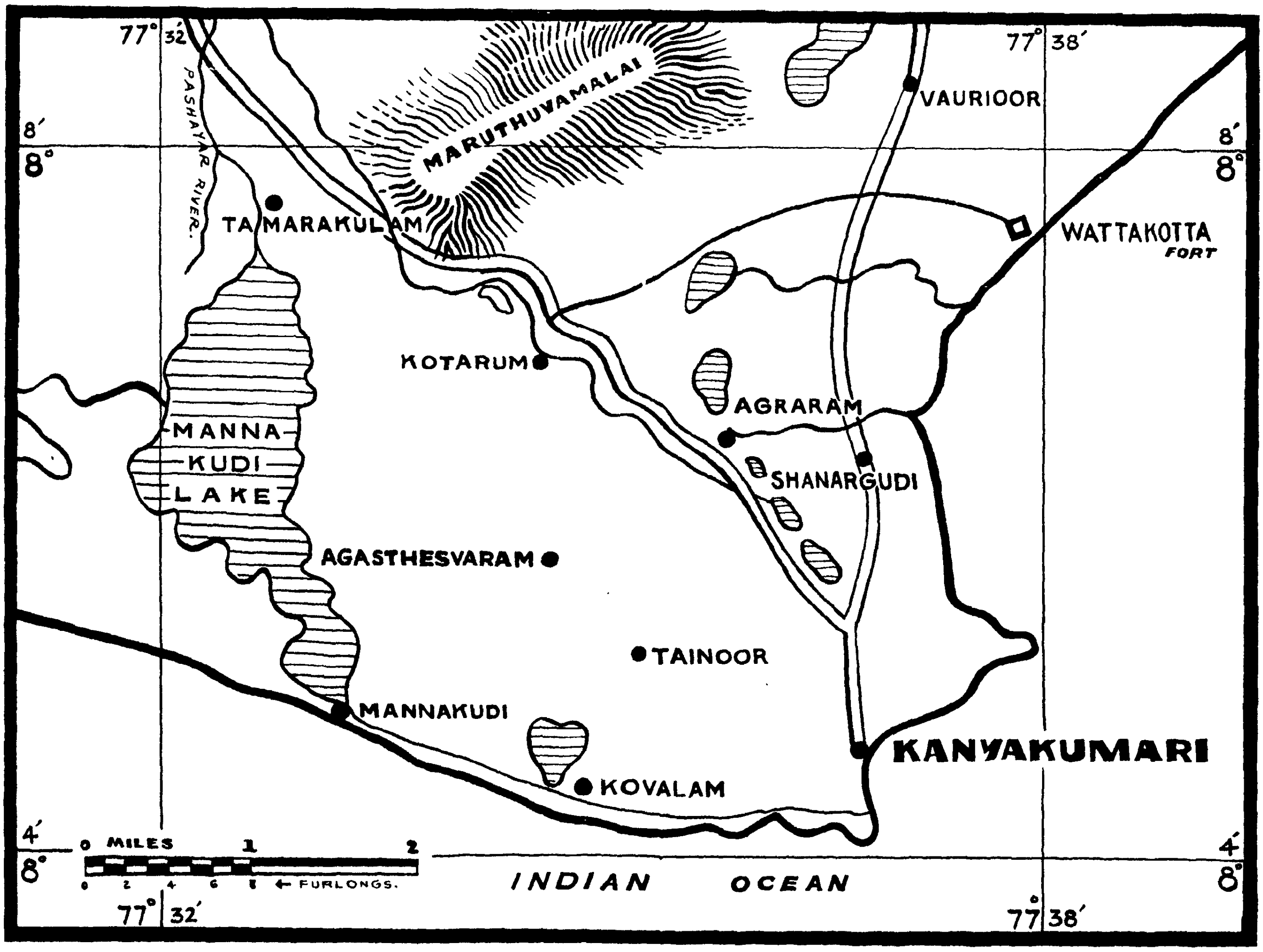
Introduction

Kanyakumari (also called Cape Comorin) which is the land's end of India where three oceans meet, is situated between 8°-4′ and 8°-8′ : 77°-32′ and 77°-38′ and has an area of 80 square km. Bourdillon (1893) and Rama Rao (1914) made studies on the flora of Travancore. The present work from 1954-1957 relates to a detailed study of the vegetation of Kanyakumari with special reference to ecology.

Physical features

The region under study is classified into the following areas: (1) narrow sea coast with recently formed sea-sand where the open foreshore vegetation is found ; the sand is fine and rich in Monazite, Ilmenite, Zircon and other rare earths ; (2) Next, the land steadily rises into a flat region with Psamophytic association. The soil is a mixture of recently formed sea sands and disintegrated rocks of archaen origin ; (3) The interior Kanyakumari has xerophytic vegetation ; orchards of Mangoes, Coconuts and Cashewnuts are present. The soil is a mixture of reddish soil and disintegrated rocks of archaen origin. The chain of hillocks noticed here represent the tail ends of Western Ghats and are mainly composed of igneous rocks of gneiss series.

The only river that drains this region is Pashayar



which joins the Manakudi lake 8 kms. west of Kanyakumari. Irrigation canals and tanks are seen in Kanyakumari interior and are full only in rainy months.

Climate

Kanyakumari has a dry climate with showers from South-west and North-east monsoons. The rainfall is about 87.5 cms. to 100.0 cms. per annum and the rainy months are May, June and July when it gets few showers from South-west monsoon ; in November and first half of December it receives showers from North-east monsoon. Since the mountain chains are low and disconnected the precipitation from the monsoons is low. The mean maximum temperature in March-April is 34.4°C and 22.7°C is the mean minimum temperature in December-January. The relative humidity in March-April is 74-76 and in December it is 79. From March to October the wind blows from the west and November to February from north-east.

The intermittent and scanty rainfall, the dropping down of relative humidity as the temperature rises up in summer months and the high velocity of dry wind result in the desiccation of the area. All these features contribute towards the development of an open type of vegetation.

Vegetation

The vegetation of the region may be classified into the following:—

I. Foreshore sandy vegetation.

The region is all sandy and the vegetation is scanty and open. The poor flora here is due to physiological dryness of the soil, scanty rainfall and strong wind velocity. *Spinifex littoreus* Merr. and *Ipomoea pes-caprae* Sweet., are the two dominant plants to the exclusion of other species. Quite near the shore are patches of *Sesuvium portulacastrum* Linn., *Atriplex repens* Roth., and *Trianthema portulacastrum* Linn.

Suaeda nudiflora Moq., *Salicornia brachiata* Roxb. and *Arthrocnemum indicum* Moq., form the important elements constituting the vegetation of salt marsh round about Manakudi lake.

Following plant associations are noted.

(1) Spinifex-Cyperus association:

Spinifex littoreus Merr.	A_5
Cyperus arenarius Retz.	A_4
Fimbristylis polytrichoides R. Br.	A_4
Cyperus pachyrrhizus Nees.	A_3
Cyperus rotundus Linn.	A_3
Launaea pinnatifida Cass.	A_3
Glinus oppositifolius (Linn.) A.DC.	A_2
Mollugo cerviana Ser.	A_2
Evolvulus alsinoides Linn.	A_3

(2) Ipomoea-Tephrosia association:

Ipomoea pes-caprae Sweet.	A_5
Tephrosia purpurea Pers.	A_4
Tephrosia hirta Ham.	A_4
Pedalium murex Linn.	A_3
Corchorus tridens Linn.	A_3
Portulaca oleracea Linn.	A_3
Portulaca quadrifida Linn.	A_3
Agyneia bacciformis A. Juss.	A_3
Mollugo cerviana Ser.	A_3
Mollugo pentaphylla Linn.	A_3
Glinus oppositifolius (Linn.) A.DC.	A_3
Gisekia pharnaceoides Linn.	A_2
Cleome tenella Linn. f.	A_2
Cyperus compressus Linn.	A_3
Sporobolus tremulus Kunth.	A_2
Fimbristylis polytrichoides R. Br.	A_1

(3) Calotropis-Cyperus association:

Calotropis gigantea R. Br.	A_5
Cyperus rotundus Linn.	A_4
Cyperus arenarius Retz.	A_4
Cyperus compressus Linn.	A_4
Sporobolus tremulus Kunth.	A_3
Enicostemma verticillatum (Linn.), Engl.	A_3
Portulaca oleracea Linn.	A_2
Agyneia bacciformis A. Juss.	A_2
Evolvulus alsinoides Linn.	A_3
Eragrostis plumosa Link.	A_2

(4) Notonia-Barleria association:

Notonia grandiflora DC.	A_5
Barleria cuspidata Heyne.	A_5
Barleria buxifolia Linn.	A_4
Euphorbia microphylla Heyne.	A_4
Launaea pinnatifida Cass.	A_3
Cyperus rotundus Linn.	A_2

II. Inland sandy vegetation.

Acacia latronum Willd., *Acacia planifrons* W. & A. and *Dichrostachys cinerea* W. & A. are the dominant species.

In the Wattakotai region Euphorbia-Jatropha association is very common while *Cleome aspera* Kœn., *Cleome tenella* Linn. f., *Borreria hispida* K. Sch., *Portulaca oleracea* Linn., *Mollugo cerviana* Ser. and *Enicostemma verticillatum* (Linn.), Engl., occur in different frequencies.

NOTE: A_5—Dominant feature of the vegetation.
A_4—Co-dominant species.
A_3—Fairly abundant species.
A_2—Common species.
A_1—Rare species.

Euphorbia-Jatropha association:

Euphorbia tirucalli Linn.	A_5
Jatropha gossypifolia Linn.	A_4
Jatropha curcas Linn.	A_4
Jatropha sp.	A_3
Euphorbia prostrata Ait.	A_3
Euphorbia thymifolia Linn.	A_3
Euphorbia rosea Retz.	A_3
Zornia diphylla Pers.	A_2
Cleome aspera Kœn.	A_2
Phyla nodiflora (Linn.) Green.	A_2
Cleome tenella Linn. f.	A_2
Borreria hispida Linn.	A_2
Aerva lanata Juss.	A_2
Corchorus tridens Linn.	A_1

III. Vegetation of the interior plains.

The interior plains represent scrub flora. The plants growing here have stunted growth caused by strong wind velocity, deficiency of water and rapid transpiration. One striking feature noted in the Agasteswaram and Kotaram region is the parasitic association of *Striga gesnerioides* (Willd.) Vatke. on *Euphorbia antiquorum* Linn.

Euphorbia-Striga association:

Euphorbia antiquorum Linn.	A_5
Striga gesnerioides (Willd.) Vatke.	A_4
Notonia grandiflora DC.	A_4
Asystasia gangetica T. And.	A_3
Pergularia daemia (Forst.) Blatt. & McC.	A_3
Leptadenia reticulata W. & A.	A_3
Tylophora indica (Burm.f.) Merr.	A_3
Sarcostemma acidum (Roxb.) Voigt.	A_2
Cissus quadrangularis Linn.	A_2
Cassytha filiformis Linn.	A_2
Hybanthus enneaspermus (Linn.) F. V. Muell	A_2

"Acacia—Flacourtia—Toddalia—Zizyphus" are the four dominant species constituting the scrub flora. Following xerophytic plants are noted here.

Flacourtia indica (Burm. f.) Merr.
Zizyphus oenoplia Mill.
Zizyphus mauritiana Lamk.
Atalantia monophylla Corr.
Jatropha glandulifera Roxb.
Ricinus communis Linn.
Toddalia asiatica Lamk.
Zizyphus nummularia W. & A.
Lawsonia inermis Linn.
Abrus precatorius Linn.
Argemone mexicana Linn.
Dyschoriste littoralis Nees.

The common trailers and twiners which grow along with the above mentioned shrubs are the following:

Pergularia daemia (Forsk) Blatt. & McC.
Ichnocarpus frutescens R. Br.
Sarcostemma acidum (Roxb.) Voigt.
Leptadenia reticulata W. & A.
Tylophora indica (Burm.f.) Merr.
Ipomoea quamoclit Linn.
Cassytha filiformis Linn.

The trees in the region are:

Thespesia populnea Cav.
Morinda tinctoria Roxb.
Pongamia pinnata (Linn.) Merr.
Calophyllum inophyllum Linn.
Phoenix sylvestris Roxb.
Tamarindus indica Linn.
Glycosmis pentaphylla (Retz.) Correa.
Ficus bengalensis Linn.
Ficus religiosa Linn.
Ficus retusa Linn.
Crataeva nurvala Buch.-Ham.
Vitex negundo Linn.
Acacia ferruginea DC.
Feronia limonia (Linn.) Swingle
Mangifera indica Linn.
Alstonia scholaris R. Br.
Artocarpus heterophyllus Lamk.
Borassus flabellifer Linn.
Vitex altissima Linn.f.
Gmelina arborea Roxb.
Dichrostachys cinerea W. & A.

Mango orchards and Coconut plantations are seen in the region. Where irrigation facilities are available paddy is cultivated. Maize is also cultivated on a small scale in the drier parts. Fields of *Cajanus cajan* (Linn.) Mills., are seen between Myladi and Kotaram.

IV. Fallow and waste lands vegetation.

Wherever lands remain uncultivated all types of aggressive weeds grow up.

The common prostrate and procumbent weeds noted here are as follows:

Tridex procumbens Linn.
Boerhaavia diffusa Linn.
Tribulus terrestris Linn.
Eragrostis plumosa Link.
Evolvulus alsinoides Linn.
Justicia tranquebariensis Linn.f.
Allmania nodiflora R. Br.
Aerva lanata Juss.
Eragrostis gangetica Steud.
Chrysopogon aciculatus Trin.
Achyranthes aspera Linn.
Rungia repens Nees.
Mimosa pudica Linn.
Amaranthus spinosus Linn.
Aristida setacea Kurz.
Justicia glauca Rottl.

Perotis indica O. Ktz.
Amaranthus viridis Linn.
Heteropogon contortus Beauv.
Stachytarpheta urticaefolia (Salisb.) Sims.
Merremia tridentata Hall.f.
Alternanthera sessilis (Linn.) R. Br.
Chloris barbata Sw.
Tragus biflorus Schult.
Dactyloctenium aegyptium Beauv.
Echinochloa colona Link.

The following are the shrubs growing in these waste lands:

Gynandropsis gynandra (Linn.) Merr.
Cassia occidentalis Linn.
Datura innoxia Mill.
Cassia tora Linn.
Lantana camara Linn. var. *aculeata* Mold.
Crotalaria striata DC.
Clerodendrum infortunatum Linn.
Capparis sepiaria Linn.
Mundulea sericea (Lindl.) Greenway.
Zizyphus xylopyrus Willd.
Cassia auriculata Linn.
Dodonaea viscosa Linn.
Argemone mexicana Linn.
Carissa carandas Linn.
Ehretia microphylla Lamk.
Croton bonplandianum (Linn.) Croizat.
Crossandra infundibuliformis (Linn.) Nees.
Clerodendrum serratum (Linn.) Moon.
Hibiscus surrattensis Linn.

Under the shade of these shrubs the following herbaceous plants are noted.

Rhinacanthus nasuta (Linn.) Kurz.
Asystasia gangetica T. And.
Heliotropium indicum Linn.
Acalypha fruticosa Forsk.
Vernonia cinerea Less.
Andrographis paniculata Nees.
Trichodesma indicum R. Br.
Justicia simplex D. Don.
Micrococca mercurialis Benth.
Peristrophe bicalyculata Nees.

V. Cultivated plants in gardens and parks.

Ornamental plants which have the capacity to stand the xerophytic conditions are cultivated in these gardens.

Lochnera pusilla (Murr.) K. Sch.
Thevetia peruviana (Pers.) Merr.
Leucaena glauca (Linn.) Benth.
Peltophorum pterocarpum Baker.
Cassia fistula Linn.
Lochnera rosea (Linn.) Reichl.
Nerium indicum Mill.
Delonix regia (Boj.) Raf.
Melia azedarach Linn.
Bauhinia purpurea Linn.
Pithecellobium dulce (Roxb.) Benth.
Tecoma stans Juss.
Plumeria rubra f. *acutifolia* Woods.
Erythrina variegata Linn. var.
orientalis (Linn.) Merr.
Duranta repens Linn.
Tabernaemontana divaricata (Linn.) R. Br.
Allamanda cathartica Linn.
Quisqualis indica Linn.
Canna sp.
Caesalpinia pulcherrima Sw.
Excoecaria cochinchinensis Lour.
Codiaeum variegatum Linn.
Russelia equisetiformis Schl. & Cham.
Millingtonia hortensis Linn.f.
Samanea saman (Jacq.) Merr.
Hibiscus rosa-sinensis Linn.
Ocimum americanum Linn.
Muehlenbeckia platyclada (Muell.) Meisn.
Bougainvillaea spectabilis Willd.
Mirabilis jalapa Linn.
Gomphrena globosa Linn.
Murraya paniculata (Linn.) Jack.
Euphorbia pulcherrima Willd.
Achras zapota Linn.

Though *Casuarina equisetifolia* Linn., thrives very well in these sandy soils they are not planted on a large scale.

VI. Vegetation of tanks and canals.

Numerous irrigation tanks and canals are seen in the region between Agraharam and Kottaram and most of them get filled up during the Monsoons. The vegetation may be divided into (1) Recession zone flora and (2) Water zone flora.

(1) Recession zone flora.

The vagaries of the Monsoon are clearly reflected in the recession zone. Common wet land weeds growing here are:

Ludwigia parviflora Roxb.
Coldenia procumbens Linn.
Lindernia anagallis (Burm.) Pennell.
Bacopa monnieri (Linn.) Pennell.
Polygonum glabrum Willd.
Ammannia baccifera Linn.
Dopatrium junceum Buch.-Ham.
Lobelia alsinoides Lamk.
Eclipta prostrata Linn.
Polygonum barbatum Linn.
Centella asiatica Urb.
Nesaea brevipes Koehne.

Cyperus kyllingia Endl.
Melochia corchorifolia Linn.
Dentella repens Forst.
Aeschynomene indica Linn.
Sphaeranthus indicus Linn.
Spilanthes acmella Murr.

(2) Water zone flora.

Three important formations noticed here are:
(*a*) The emerged amphiphytes,
(*b*) The submerged hydrophytes
and (*c*) The floating hydrophytes.

(*a*) Emerged amphiphytes: The emerged amphiphytes are confined to the marginal and littoral parts of tanks. There is a continuous link between the vegetation of recession zone and the emerged amphiphytes of the water zone. Species noted here are:

Asteracantha longifolia Nees.
Aeschynomene aspera Linn.
Scirpus articulatus Linn.
Scirpus supinus Linn.
Hydrolea zeylanica (Linn.) Vahl.
Limnophila heterophylla Benth.
Monochoria vaginalis Presl.
Saccolepis interrupta Stapf.

(*b*) Submerged hydrophytes: There is no zonation in the distribution of the submerged hydrophytes and they grow throughout the basin of tanks. The submerged forms may be divided into (*i*) Anchored submerged hydrophytes and (*ii*) Suspended hydrophytes.

(*i*) Anchored submerged hydrophytes are:
Ottelia alismoides Pers.
Vallisneria spiralis Linn.
Lagarosiphon alternifolius (Roxb.) Druce.
Hydrilla verticillata Casp.
Blyxa octandra Planch.

(*ii*) Suspended hydrophytes:
Ceratophyllum demersum Linn.

(*c*) Floating hydrophytes: Floating hydrophytes also do not exhibit any zonal arrangement of vegetation and they are seen throughout the water surface from the marginal part to the central part of a tank. They may be classified into (*i*) Attached forms with floating leaves and with floating shoots and (*ii*) Free floating forms.

(*i*) Attached hydrophytes with floating leaves and with floating shoots are:
Aponogeton natans Engl.
Potamogeton indicus Roxb.
Nymphaea stellata Willd.
Nymphaea pubescens Willd.
Limnanthemum cristatum Griseb.
Jussiaea repens Linn.
Neptunia oleracea Lour.
Pseudoraphis aspera Pilger.
Nelumbo nucifera Gaertn.

(*ii*) Free floating forms are:
Pistia stratiotes Linn.
Azolla pinnata R. Br.
Lemna paucicostata Hegelm.
Trapa bispinosa Roxb.
Eichhornia crassipes Solms.

Family Nymphaeaceae is very well represented in all these tanks and so a particular tank is called "Tamarakulam" (Tank of lotus).

VII. Marine phanerogams.

Luxuriant growths of marine algal flora are seen in the crevices of rocks that abut in to the ocean. Marine angiosperms are few, this is evidently due to the constant pounding of the waves. The Marine phanerogams are represented by *Halophila ovalis* Hook. f. and *Enhalus acoroides* Rich.

SUMMARY

The vegetation of Kanyakumari is described as occurring in different regions for easy evalution and study.

The plant associations in each region are listed.

The Hydrophytes are classified based on their morphology and habit.

The climatic conditions here bear the impact of both the humid rainy climate of West Coast and the dry hot climate of the coast and plains of Tinnevelly District. Since the latter conditions are predominantly felt the vegetation of the area tends to be xerophytic.

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